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BRAIN EXHAUSTION,

AND

ITS TREATMENT.

BY



J. LEONARD CORNING, M. D.,  
NEW YORK.

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## BRAIN EXHAUSTION,\*

### AND ITS TREATMENT.

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MR. PRESIDENT AND GENTLEMEN: The subject which I have selected for the discussion of your honorable body this evening is one which, by reason of its vast influence upon human affairs, is eminently worthy of scientific attention. Side by side with the progressive intellection of the century there have accumulated a host of clinical data, which point to a progressive decrepitude in the effectiveness of the thought mechanism itself. With the various advances in the mechanical facilities which place the individual in more complete harmony with extraneous conditions, it is a melancholy fact that a concomitant dissonance in the mental economy of the individual himself has become quite as characteristic a symptom of the progress of civilization as the advances in the mechanical arts or the exact sciences.

Therefore, in spite of the conquests over external nature, there is very much still to be learned concerning that

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thought mechanism the progressive manifestations of which have given us the astonishing control over the external world which is so characteristic a feature of the age.

Whereas the great question among individuals and nations has been, and must of necessity always continue to be, how to make surrounding nature subservient to the ends of organic life, there is yet another problem, which would appear to be the direct outgrowth of the heated competition of modern life, and which demands that, in the struggle for existence, the individual shall not only harmonize with his environment, but shall also be in accord with himself—shall preserve his physiological integrity in spite of the storm without. Among muscle-workers the question is one involving the normal assimilation and the conversion of forces into heat and mechanical labor. To the brain-worker the problem involves, in a modified degree, not only all that is contained in the foregoing, but, in addition, the whole question of mental economics.

We know of an inadequacy of the functional capacity of the motor apparatus dependent upon malnutrition of the muscle itself. We are also cognizant of a similar state of things affecting the organ of thought. It is of this impairment—this exhaustion of the functional capacity of the thought mechanism—that I would speak this evening.

Under the designation cerebral exhaustion I propose to consider a group of clinical phenomena, the chief feature of which is a morbid limitation of the ratiocinative capacity of the individual consequent upon functional brain disease.

The manifestations of cerebral exhaustion are chiefly comprised under the following headings :

### *Psychical Symptoms.*

1. Morbid Limitation of the Ratiocinative Processes.
2. Morbid Emotional Phenomena.



3. Derangements of Memory.
4. Volitional Impairment.
5. Evanescent Mental Confusion.
6. Disorders of Sleep—Morbid Dreams.
7. Lack of Mental Concentrativeness.

*Physical Symptoms.*

8. Ocular Symptoms.
9. Acoustic Symptoms.
10. Vaso-motor Disturbances and Cardiac Derangements.
11. Local Head Pains.

*Secondary Symptoms, sometimes consecutive to or accompanying the Primary Exhaustion.*

12. Insufficiency of Voluntary Muscular Power.
13. Morbid Fears.
14. Lachrymose Condition in the Male (wrongly designated Hysterical).
15. Morbid Sexual Manifestations.

It will be more expedient to discuss these symptoms, as far as possible, in the clinical order of their occurrence rather than to follow the purely mechanical subdivision just indicated.

First, as to the more prominent characteristics of the disorder. The first symptom often noted in cases of cerebral exhaustion is great restlessness during the day and more or less wakefulness at night. During the early morning hours there is often present a marked degree of drowsiness, and the persons thus afflicted frequently complain that they do not awake till midday. Soon the disturbance becomes greater; pains are felt in the regions of the vertex or above the superciliary arches. These pains are frequently produced by the most trivial mental exertion. I

am at present attending a gentleman who, after reading the newspaper for only five or six minutes, is attacked by a most intolerable vertical pain. Sometimes the pains are occipital, and then the application of the faradaic current will often suffice to dissipate the symptoms.

In cases of unilateral or vertical headache, however, the problem is not so simple, the disagreeable symptoms often requiring more or less protracted treatment for their dissipation. The head pains are soon followed by mental phenomena of considerable intensity. The afflicted person complains of great mental lassitude, often bordering on absolute prostration. Even the slightest mental exertion is painful, and soon difficulty is experienced in performing even those semi-automatic mental operations which are incident to every-day life. Disorders of memory are among the most frequent symptoms. Sometimes the memory for both past and recent events is impaired; but I have remarked in very many instances that, while early occurrences are recalled with sufficient facility and accuracy, recent events make but slight impression, the individual being sometimes unable to tell chronologically what has occupied his attention even during the past few days. Familiar names and numbers are forgotten with particular readiness. When the disorder has continued for a considerable length of time, the will is seen to be impaired—so much so, in fact, that even the most trivial voluntary actions are a source of discomfort. To this condition of volitional impairment is added a high degree of morbid irritability. Small disappointments are magnified a thousandfold, and those occurrences which under normal conditions would be deemed trivial assume overwhelming proportions. Frequent outbursts of uncontrollable anger, upon the slightest provocation, are among the most characteristic phenomena observed at this time, and are followed by more or less depression.



Among the most striking physical symptoms which point to the derangements in the cerebral economy are the disorders of the vaso-motor system.

When even slightly irritated or excited, the face becomes livid, whereas feet and hands are at the same time often cool to the touch. If now the radial pulse be examined, it will frequently be found to be quick and thready, whereas when the finger is placed upon the carotid or temporal artery the pulsation is found to be unusually strong. There is often present in these cases a tendency to abnormal cardiac action, palpitations being among the very frequent accidents. Hyperæmia is, however, by no means always a constant factor. On the contrary, the condition of mental exhaustion is in a very large number of instances found in conjunction with very considerable general or local anæmia, or both. Under these circumstances the two conditions of cerebral hyperæmia and anæmia very frequently alternate with each other; and it is perfectly clear that, according to whether the subject is seen during a period of cerebral plethora or anæmia, will be the diagnosis of the vascular condition. This circumstance has given rise, it would seem, to erroneous interpretations in many instances. These vascular derangements, though of secondary origin, being the direct outgrowth of an irritation of the protoplasm of the cells concerned in the evolution of mind and transmitted thence to the vaso-motor apparatus in the medulla by channels, which anatomy and physiology have not as yet satisfactorily demonstrated, are of the utmost importance on account of the irritation which they in their turn exercise upon the already irritated cortical area. Consequently they deserve especial attention in any consistent plan of therapy, and it will, therefore, not be a matter of surprise that a certain degree of prominence has been assigned to their treatment. In a recent monograph I have

detailed at some length the experimental researches of myself and others concerning the relation of the cerebral circulation to brain function. Viewed in the light of those inductive researches which I have only time to briefly refer to on the present occasion, the importance ascribed to these circulatory anomalies will be perfectly comprehensible. Very noteworthy are the ocular appearances in the early as well as in the more advanced periods of the disease. Particularly characteristic is a dead and "bottomless" aspect, which, though hard to describe, when once seen is never forgotten.

Where the vascular derangements were more or less unilateral, I have sometimes remarked an unevenness of the pupil, as well as local spasms in the adductor pollicis and other small muscles of the hand. These latter symptoms, however, are comparatively infrequent. Tinnitus is not seldom met with, especially at night. When the disease has continued for a considerable length of time the condition of depression, alternating with outbursts of anger, becomes more and more pronounced until the subject is reduced to a deplorable state—often bordering on suicide. Friends, society, and even solitude become subjects of aversion and apprehension, the morbid dread often assuming fantastic and unexpected forms. For my own part, I have found these manifestations of morbid fear so manifold that specific designations have appeared to me superfluous, though others have made attempts in this direction. During the hours of morbid wakefulness hallucinations may occur, and, when this is the case, the mental condition of the patient may be considered more or less critical, unless energetic treatment should cause an abatement of the grave symptoms.

Before entering upon the discussion of what has appeared to me to be the most effective method of treatment to be pursued under the clinical circumstances, which I have

just sought to describe chronologically, as far as possible, one word in regard to the *causation* of the above state of mental insufficiency. *As predisposing factors may be mentioned:* 1. That form of diathesis known as *nervous*, in which, although the temporary effectiveness of both the motor and physical apparatus is great, there is at the same time very little capacity for husbanding reserve energy. 2. Certain geographical peculiarities, and atmospheric conditions associated with diminished pressure and other factors of which we are still ignorant. 3. Occupations necessitating an abnormal amount of mental exertion. 4. The extreme subdivisions of labor, both mental and physical, incident to modern specialization, necessitating morbid concentration and excluding the rest formerly derived from employments requiring more general acquisition and a greater field of activity. *Exciting causes are:* 1. Extreme mental worry, accompanied by excessive mental exertion. 2. Constitutional drain through excesses—particularly sexual. 3. Malnutrition, general anemia, and, 4, menstrual derangements. 5. Derangements of sleep, involving insufficient repair of the cortical cells concerned in intellection, and eventually resulting in the predominance of the processes of disintegration over those of integration in the central nervous system. 6. Certain organic diseases involving excessive waste, more particularly renal troubles, when accompanied by any considerable output of mental energy, may result in cerebral exhaustion. 7. Spasmodic, unsystematic, desultory methods of intellection. 8. Mental shock: Disappointment, profound grief, pecuniary losses; in a word, all those accidents which, acting with more than ordinary severity upon the psychical centers, cause, primarily, a derangement in sleep—a discrepancy between waste and repair, and, as a secondary consequence, chronic inability on the part of the cell to hoard up the physiological amount

of explosive energy: hence the inability of those suffering from the disorder under consideration to continue any species of mental work for a considerable length of time without resorting to more or less prolonged periods of repose. In exquisite cases, reading, writing, or even a moderate amount of thought, can only be continued for a few minutes.

From the foregoing considerations it is evident that the essential pathological condition is one of defective nutrition, comprising not only very considerable secondary vaso-motor anomalies, but, what is of the very first importance, insufficiency in the nutrition of the cell itself.

Admitting the foregoing to be the proper pathological interpretation of the morbid symptomatic phenomena, I know of but one rational system of therapeutics to be adopted in these cases; in a word, the problem presented for solution is how to again replenish the exhausted brain resources, and at the same time to improve the deteriorated mechanism of supply. In other words, the treatment must be addressed not only to the regulation of the morbid circulatory phenomena, but also to the stimulation and eventual restoration of the energy of the cell itself. The great factor in the successful treatment of this class of cases is rest—perfect, undisturbed tranquillity of the thinking apparatus—not the limited amount of rest suited to the healthy brain, but a quantity greater in proportion to the degree of morbid deterioration. By prolonged sleep it is possible for the ganglia to hoard up an amount of energy proportionate to the duration and profundity of the sleep itself, or, in other words, in the ratio of the reduction of the daily output of brain energy. Thus by slow degrees the proper correlation between integration and disintegration may be re-established. It is useless, however, to hope for any permanent results at once, for, when the perverted nutritive conditions have once become established, nothing short of prolonged



rest can by any possibility result in the re-establishment of the normal nutritive processes of the cell economy.

The practical problem of cerebral rest I have sought to systematize as far as possible; but in communications on this subject have not forgotten to exhibit the many-sided aspect of the question. Indeed, it is sufficiently clear that the solution of this question is not to be compassed by one idea; there are no specifics here. What is required, however, is a comprehensive, practical, consistent plan of treatment—one based on the physiological and clinical exigencies. Where the function of sleep is affected, as it is in the majority of cases, it is impossible to increase at once the amount of rest to a sufficient extent to meet the demands of the morbid cerebral condition. Nevertheless, by gradually increasing the duration of the sleeping period, it eventually becomes possible to afford the patient an amount of rest sufficient to neutralize by slow degrees the condition of irritation and exhaustion. The bromides should be given during the day in cumulative doses, in order to allay the condition of irritability, and to cause a progressive decline in the mental manifestations as the hour for complete repose approaches. There should be no hesitation in employing sedatives, but always with the understanding that their use is only a measure of temporary expediency. Although I have found that in such cases permanent good is only to be obtained through the agency of protracted rest, a persistent course of tonic treatment should be undertaken as well. Thus, the fluid extract of coca, taken with claret or Burgundy, has an immediately stimulating effect in those cases. In cases of general anæmia, strychnine, iron, and the phosphates may be given. The most difficult class of cases to manage is that in which there is present some stomacheic weakness precluding the possibility of any considerable medication, and necessitating a more or less protracted discon-



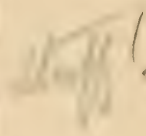
tinuance of treatment from time to time. Phosphorus is a remedy which, in these derangements, often yields most excellent results; and although opinion differs as to whether the amount of phosphorus excreted is increased or not by an exercise of the intellectual faculties, the fact still remains that excellent therapeutic results are obtained from the employment of this remedy.

A systematic feeding is another factor of paramount importance in the treatment of these cases; without it the good results obtainable by absolute rest are greatly lessened.

In closing these very general remarks, I can not refrain from adding a word respecting the method by which I seek to practically carry out the above principles of treatment, namely: 1, Cerebral rest; 2, increased general and cerebral nutrition; 3, elimination of psychical irritation.

The subject is secluded in a darkened room from ten to fifteen hours at a time, according to the amount of sleep which it is desired shall be had during the twenty-four hours. The amount of sleep is *progressively* increased by habit, moderate medication, and hydro-therapy, and no attempt is made to produce a sudden state of stupor by the reckless use of sedatives. When the patient awakes, as is usually the case, two or even three times during the hours set apart for rest, nourishment is administered, but always in a fluid and easily digested form. Where difficulty is experienced in again falling asleep, resort is had in the beginning to limited medication. The few hours of wakefulness are devoted exclusively to some form of amusement—reading, writing, and even the mildest forms of mental concentration being absolutely prohibited. This, in brief, is the method from which I have already seen most happy results, and from the employment of which I hope and believe much good will in future be derived. It is hardly necessary to say that the problem of cerebral rest is essentially

different and presents many more difficulties than spinal rest. To give repose to the motor cells of the cord is comparatively an easy problem, and one which only exacts a permanent fixation of the motor apparatus for its solution, the consciousness or unconsciousness of the individual being only a matter of secondary importance. Rest, however, for those cells, the function of which is the evolution of mind, can only be obtained by a prolonged period of absolute unconsciousness; and this, as a matter of course, will often tax the patience and resources of the physician to the utmost. Perseverance and the utilization of the principle of habit will usually, however, render essential assistance.











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